LEARNING OUTCOMES

- explain the purpose of latitude, longitude, parallels, and meridians
- locate on a world map the continents, major landforms, major bodies of water, and climatic and vegetation zones
- appreciate the diversity of the global natural environment

Getting Precise About Location

When we study location, we are looking for the answers to two questions: Where is it? Why is it there? With new technology, it is quite easy to determine your location very precisely. A Global Positioning System (GPS) receives signals from an orbiting satellite. Instantly, you receive your position in latitude, longitude, and elevation. You know exactly where you are on Earth. The locational information given by GPS can be stored in computers. Later, this information can be turned into maps. Using GPS, it is now possible to know the exact location (within a few metres) of any spot on Earth. GPS is very useful for many things, like boater safety and hiking. GPS is also used to help towns and cities locate features on maps exactly. This type of locational information has made mapping more precise. Humans have come a long way from the methods of early explorers to find their positions and make maps of areas they encountered.

Fact File

GPS was first used by the military to help armies pinpoint positions. It’s now used by sailors, mapmakers, surveyors, and others. One of its newer uses is to help direct cruise missiles.

KEY VOCABULARY

absolute location
boundaries
characteristics
climate
coordinate system
divide
drainage basin
eastings
ecozone
El Niño
functional characteristics
geologic regions
Global Positioning System (GPS)
grid
human characteristics
landform regions
latitude
location
longitude
natural forces
northings
physical characteristics
physical regions
region
rural regions
soil regions
time zones
urban regions
vegetation
wilderness regions
Where Are You Exactly?

There are many types of maps. Some of the most common are

- provincial road maps
- street maps
- topographic maps that show surface features in detail

Different grid systems are used to find the locations of places on maps. A road map usually uses a letter/number system to help you find locations. Topographic maps use reference systems such as the six-figure grid coordinate system of eastings and northings.

Latitude and Longitude

Maps and globes are divided by imaginary lines that run east and west, and lines that run north and south.

- East–west lines are called lines of latitude. They are also called parallels.
- Latitude is measured in degrees (symbol °) north or south of the Equator.
- The Equator is the line at 0° latitude.
- Latitudes are numbered from 0° to 90° North and from 0° to 90° South.
- The two poles are the highest latitudes.
- Imaginary north–south lines are called lines of longitude; they are also called meridians.
- Longitude is measured in degrees east or west of the Prime Meridian.
- The Prime Meridian is the line at 0° longitude.
- Longitudes are numbered from 0° to 180° East and from 0° to 180° West.
- Longitude lines meet at both poles.
Absolute Location
It is important to be able to locate places precisely. We need to be able to give the absolute location of a spot on Earth. When natural resources are found, the absolute location must be determined. The absolute location makes the resources the property of one country and not another. Suppose oil is found along the border of two countries with a clearly defined boundary. It is important to know exactly where the oil field lies to determine who owns it.

Oil was discovered in the Gulf of Mexico. Part of the Gulf belongs to the United States. Part belongs to Mexico. It was very important to find out how much of the oil was in the United States and how much was in Mexico. Canada and the United States dispute who has the right to fish for salmon in parts of the Pacific Ocean. They need to know the absolute locations of the boundaries between the states of Washington and Alaska with the province of British Columbia. Absolute location affects trade and economic growth. It is also important to help resolve conflict between groups, companies, or countries.
Does the Place Make Sense?

There are many reasons why places are located where they are. Physical characteristics of the area affect where places are located. It is important to consider the landforms. Are there hills, ridges, or valleys? Bodies of water are also important. Is there a lake or a river nearby? Well-drained soil makes a better location for a place than soil that is poorly drained. Vegetation, weather, and climate also affect where places are located. Is the area forested, or is it grassland? Is it cold or hot, wet or dry?

It's Your World

Think about setting up a colony on the moon. You want to be able to have all the essential things for your life at your new lunar site. You can't take everything. There's not a lot of room on the shuttle craft. List the 20 things you will take. People can be on your list. You might want a doctor.
Other places were chosen for their location based on human characteristics. People tend to locate where there are other people. Large cities attract people. If there is a river or lake, communities tend to spread along the riverbank or the lakeshore. People tend to live with people of a cultural background similar to their own. Religious reasons can also affect where people choose to live. Some people want to live near the centre of their faith, like Jerusalem or Mecca.

Locations for places like towns, farms, or factories are chosen because of distinctive human and physical characteristics. These different characteristics allow us to distinguish places from each other.

**Figure 1.8**
The Blue Mosque is a holy site for Muslims.

1. Think about your community. Why is it located where it is? What physical and human characteristics affect its location?
2. Think about the activities in your life. How could GPS be useful in your life?
3. Imagine you are the ruler of a country. Why is absolute location important to you and your country?
Different Ways of Organizing the World

Any area that has a set of defined characteristics is a region. Your neighbourhood is a region. Your schoolyard is a region. Your town or city is a region. Your home has regions in it. It has different spaces where you eat, sleep, relax, and work. Each is defined by a certain set of shared features or characteristics.

Regions are areas used in the study of geography. We organize the world into spaces and places called regions. This makes the investigation of physical and human patterns easier and more understandable. Creating regions helps us see and explain relationships and connections more clearly.

Canada is divided into postal regions to make mail delivery faster. Every address has a postal code, such as R2W 4A6. The first letter in your postal code indicates the largest region that your address is part of (your province or part of it). The last number tells the smallest part of your postal region (your section of a street or rural road). Find out what your postal code is and compare with your classmates.

Think about the criteria that make your neighbourhood a region. Does this neighbourhood resemble yours? How is it the same? Different?
A region is a space or area defined by certain characteristics. A region has definite limits to its size. It also has boundaries that outline its area. Your neighbourhood region may have boundaries that are streets, a river, a rail line, a farm, a forest, or a park.

Regions can be very small, like your bedroom. They can be physical regions that cover vast areas of the globe, such as the Coniferous Forest Region or the Sahara Desert. Some regions are political, like Canada or Manitoba.

![Map of Winnipeg and surrounding regions](image)

**Figure 1.11**

There are several levels of political regions in Canada. Name the political regions you live in.
Is Anybody There?

The world can be divided into three main regions based upon where people live. There are wilderness regions where no people live. There are rural regions, which are farms and country. Urban regions are towns and cities.

Wilderness Regions

Wilderness parks are the landscape of the soul. They are about beauty, about reflection and quiet contemplation. They are about a society that retains enough humility to leave some part of nature alone...

Harvey Locke, President of the Foundation for Canadian Parks and Wilderness

Figure 1.12
Some wilderness regions cover vast land areas but have similar characteristics throughout. What are some of the physical characteristics that define a polar region?

Figure 1.13
The Boreal Forest covers much of the northern parts of Canada, of Europe, and of Asia. The trees are needle-leaf trees like spruce and pine. What other characteristics define this region?
Rural Regions
A rural region has open countryside with few towns. As our population has grown, the number of people living in rural areas has decreased. Urban and rural regions in Canada have changed a lot over the past hundred years. Only about 20 percent of Canadians now live in rural regions. Fewer farmers are needed to supply our food because of technological advances.

Urban Regions
An urban region has little open countryside. Many urban regions try to create rural areas inside them in the form of parks. In Canada, about 80 percent of the population live in towns and cities.

1. In 1911, 41 percent of Canadians lived in urban areas; now, nearly 80 percent do. Do you think Canada’s population will ever become 100 percent urban? Explain your reasons.
2. List four reasons why people would choose to move to cities from rural areas.

<table>
<thead>
<tr>
<th>Year</th>
<th>% of Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1881</td>
<td>Rural 24 000 000</td>
</tr>
<tr>
<td></td>
<td>Urban 6 000 000</td>
</tr>
<tr>
<td>2001</td>
<td>Rural 24 000 000</td>
</tr>
<tr>
<td></td>
<td>Urban 6 000 000</td>
</tr>
</tbody>
</table>

**Figure 1.15**
What identifies this as a rural region?

**Figure 1.14**
Identify three characteristics that make this an urban region.

**Figure 1.16**
What was the ratio of urban population to rural population in 2001? How has the number of people living in rural and urban areas changed over the past 100 years?
Regions and Change

A region can be defined by its physical characteristics. These could be soil, type of terrain, or the amount of precipitation. Another way to define a region is by its human characteristics—religion, language, or culture. A third way is by its functional characteristics. The ways we use a region, such as for farming or for industry, fall into this group.

Physical Regions

Physical regions, such as the Himalayas (a mountain region), or the Sahara (a desert region), are defined by their physical characteristics. Each physical region has a common characteristic throughout its area.

Figure 1.17
What is the most important physical region in your area?
Desert Regions
Deserts are regions that receive less than 250 mm of precipitation per year. Look at the map of average precipitation in North Africa. It helps to show us the boundaries of the world’s largest, hot desert region.

Geologic and Landform Regions
Geologic and landform regions give us a way to study the Earth’s crust. Geologic regions are areas whose main characteristic is that they have the same types of rocks. The Canadian Shield is a geologic region. Landform regions are areas whose main characteristic is that they have the same major surface features. The Interior Plains and Hudson Bay Lowlands are landform regions.
Climate, Vegetation, and Soil Regions

**Natural forces** define climate, vegetation, and **soil regions**. These three types of regions usually have the same boundaries. This is no accident! The climatic conditions of a region affect the types of vegetation that can grow there. The climate and vegetation affect the soils that develop. A specific climatic region will produce a specific vegetation region. In turn, the vegetation region makes a specific soil region.

Soil regions have similar patterns to geologic, landform, and climatic regions. A polar region has a cold, dry climate — a cold desert. It is a region that has little vegetation and very poor soil. A tropical region has a warm, wet climate, which is perfect for plant growth. Thick soil forms rapidly in this region.

**Regions Within Regions**

There are regions within regions. A coniferous forest is a large vegetation region. It can be divided into many smaller sections where climatic and growing conditions vary. Pine trees prefer sandy soils. Spruce or cedar trees like wet and boggy soil. They will be found in another area of the forest.

---

**Fact File**

- The coldest temperature ever recorded was -89.6°C at Vostok, Antarctica; the hottest was 58°C at Al Azizyah, Saudi Arabia.
- The record for drought was 0 cm of precipitation for 14 years in Arica, Chile; the wettest was 2646 cm in one year at Cherrapunji, India.

---

**It’s Your World**

Only three Canadian cities are in a climate region that lets them “guarantee” that there will be snow on December 25. One such city is Winnipeg. Discover the other two.
Weather Changes Regions

Sometimes changes in the weather patterns in another area of the world can cause changes in our regions. Amazingly, the pattern of ocean currents over 8000 kilometres away affects our lives here in Manitoba. **El Niño** is a huge mass of very warm water that appears frequently off the coast of northern South America. Since 1985, El Niño has affected the weather in our regions several times. El Niño caused changes in our weather in 1986, 1991, 1994, and 1997–98. It is difficult to predict what effect an “El Niño” year will have on the weather in North America. However, more storms, higher precipitation, and more extreme seasonal temperatures can result.

**Fact File**

El Niño is the name for warmer-than-normal sea surface temperatures in the Pacific Ocean off the west coast of South America. La Niña is the name for colder-than-normal sea surface temperatures in the Pacific Ocean. La Niña tends to have the opposite effect on weather patterns in other regions.

**Check Back**

1. Choose a capital city in one of the provinces of Canada. In point form, describe the physical region it is in. Think about the different ways you could describe the physical region it is in. Think about landforms, type of rocks, climate, vegetation, and soil.

2. Describe the region you live in as
   a) a climate region
   b) a soil region
   c) a landform region
   d) a vegetation region

3. Look at a map of Canada. Where do most people live? What is the connection between physical regions and where most communities are located?
Get Into the Zone

We define regions to make things simpler and easier to handle. **Time zones** were developed to help us better communicate with people living in other parts of the world.

Generally, each time zone represents a one-hour difference in time. Time zones start at Greenwich, England. It is from here that the 24-hour clock is measured.

The width of each zone is 15 degrees of longitude. This is based on the Earth making one rotation of 360 degrees in 24 hours \( \frac{360}{24} = 15 \).

In 1878, Sir Sandford Fleming, a Canadian railway surveyor and construction engineer, led the development of the time zone system. His system was adopted worldwide in 1884. Today, with faster transportation and mass communication systems, time zones play an even greater part in our lives. If it is midnight in London, England, what time is it in Brandon, Manitoba? in Vancouver, British Columbia? in Moscow, Russia? How can these variations affect you?

![Time Zones Diagram](chart.png)

**Figure 1.22**

If it’s noon in London, England, what time is it in your area?
Our Ecozones

Regions can have one main characteristic in common. It might be vegetation or population. Regions can also be defined by more than one factor. They can share physical and human features. A region could be defined by plains (physical) and farms (human). When we combine natural features and human activities in a particular area, we create a region called an ecozone.

The Riviera region along the north Mediterranean seacoast is an ecozone. It includes parts of several countries (political regions). These parts all have beaches and coastal mountains. They also have a climate that is generally warm and dry all the time (physical region). Similar kinds of crops are grown — grapes and olives (vegetation region). It has summer year-round, so the area has become popular for holidays (human region). All of these things together have made the area a unique ecozone.
Canada’s Ecozones

In Canada, we have fifteen distinct land-based ecozones and five marine-based ecozones. Defining these regions helps when dealing with problems and issues. Suppose we want to create a park to protect unique physical features or the habitat of particular animals. We need to know where the ecozone begins and ends. We also need to understand how everything is connected within that ecozone.

People are the driving force behind change to ecozones. There is a strong connection between our environment and our human activities. Our ecozones are affected by pollution and climate change. These are caused by our use of resources and our way of life. We use more land for agriculture and our growing cities. What we do affects our natural environment. We can threaten it or conserve it. It is important to be aware of how our activities affect the physical characteristics of ecozones.
Regional Boundaries

Some regional boundaries are natural. They can be rivers, the crests of mountains, coastlines, and bodies of water. Sometimes natural boundaries such as mountains act as obstacles, or barriers. Others, such as rivers, separate, but they also allow contact and communication.

Divides

One natural physical region is a drainage area, or drainage basin. All the water that falls as precipitation and runs off the land in a basin drains into one main river. This river usually flows into another body of water. The boundary between drainage areas is called a divide.

Figure 1.26
The Alps form a boundary for parts of different countries. Use an atlas to discover which countries.

Fact File

The greatest drainage boundary in North America is called the Continental Divide, or the Great Divide. If you were able to stand right on the Divide with a pail of water and dump it, half would flow toward the Pacific Ocean, and the rest would flow toward the Atlantic Ocean or Arctic Ocean!

Figure 1.27
In this example, there are two divides, making the water flow into three different drainage basins. Check to discover where the runoff water drains in your area.
Drainage Basins in North America

North America has five major drainage basins. Water runs off North America into the Pacific Ocean, the Arctic Ocean, Hudson Bay, the Atlantic Ocean, and the Gulf of Mexico.

1. Name three natural boundaries in your area.
2. If a chemical were spilled in a river or stream in your region, where would it go? Make a map of its route. List the damage and dangers it could cause.
Skills for Active Democratic Citizenship

1. Study the words to our national anthem, “O Canada.”
   a) What characteristics does the songwriter recognize as important about our country?
   b) Find out about the history of our national anthem. Why is it important for our country to have a national anthem?
   c) Why is it important that people show their respect during “O Canada”?

2. You live in a physical region of Canada. It is part of an ecozone.
   a) What can you do to help conserve the environment in your ecozone? Make a list of possible ideas. Choose two that you can put into action and make part of your daily life.
   b) In small groups, suggest what your class can do to help conserve and protect the ecozone in which you live. Make a list of all of your ideas. Choose two that your class can put into action immediately.
   c) Share your conservation plan with the other groups. Create a master list of actions. Display this master list. At the end of each week, review the list and evaluate how your class is doing. Decide what you are doing well and congratulate yourselves. Identify what you could do better, and work to improve your actions.

Skills for Managing Ideas and Information

3. Imagine that you can create your very own ecozone. To plan your ecozone, create a chart with these questions:
   a) What shape will your ecozone be?
   b) Which landforms will be in your ecozone?
   c) What bodies of water will be in your ecozone?
   d) What will be the climate in your ecozone?
   e) What vegetation will be in your ecozone? Remember that your climate will affect the vegetation.
   f) What kind of soil will be in your ecozone?
   g) Where will communities be located in your ecozone?
   h) What natural resources will your ecozone have?
   i) How will people use these resources to make a living?
   j) Where will people go for holidays in your ecozone?

4. Create a map of your imaginary ecozone that shows
   a) the major landforms
   b) the major bodies of water
   c) the climate zones
   d) the vegetation zones
   e) the main communities
   f) the location of your natural resources
   g) the location of any protected areas or parks

Your map must have a compass rose and a legend.
Critical and Creative Thinking Skills

5 How do you describe to someone how to get to your place, your city hall, or some other location? Write down your directions to a location some distance away. Did you use direction and distance, or mainly landmarks in your description? If you used mainly direction and distance, your description emphasized map skills. However, if you used mainly landmarks, you emphasized places that stand out as unique or easily seen.

6 Different regions at the same latitude have many characteristics in common. Research a set of regions that share the same latitude. Pose and answer four geographic questions about these regions (e.g., Why are fiords common on the coast of British Columbia?).

Communication Skills

7 a) Investigate the beginnings of two interesting places in your community. Consider such things as: When were they created or built? Who named them? How do the names relate to the earliest people or settlers there? Have the features changed since their beginnings?

Also investigate the changes in place names in your community that have occurred over the past twenty years. If possible, find out why they changed.

b) In groups, share your findings and create a chart of your research under appropriate headings to post and show the rest of the class.

8 Survey your class for each student’s postal code. List them on the board. Notice that the codes all have the same first letter. Perhaps all the students’ codes in your school will have the first three characters the same, and likely the fourth. If you live in a big city, it is probable that the only difference will be the last letter and the number in the postal code. In rural areas, where nearly everyone travels a significant distance to school, the postal codes may differ greatly in the last three characters.

a) Get a map of the area around your school. Plot the location of each student’s home by placing a dot and the last three characters of the code on the map.

b) On your map, draw lines that separate your school area into postal regions. Compare your boundaries to an actual postal code map of your region.

c) Postal regions help us find addresses and speed up mail service. List two other regions that have been created to provide services.